TWO OF THE AUTHORS REPLY

We thank Drs. Volpe and Tavares for their letter (1) and their interest in our work (2). It gives us the opportunity to reconsider several issues in this analysis, which are at risk of being misinterpreted or overlooked. In particular, their letter addresses the following four questions: 1) how should we deal with climatic conditions in the analysis of seasonal effects? 2) which methods show promise in the analysis of time series incorporating seasonal effects? 3) which conclusions can be consequently sought and reached? and 4) which research strategy would improve our knowledge most effectively?

To advance our argument, weather conditions are omnipresent determinants of physiological, psychological, and social cycles. They comprise circannual hormonal processes as well as cyclical habits regarding changes of clothing. Metaphorically speaking, we investigated whether suicide seasonality is associated with hormones or with clothing habits. In contrast to Volpe's and Tavares' reading of our text (1), we did not investigate nonclimatic seasonal effects. We referenced such effects (e.g., end-of-year effects (3) or holiday and birthday effects (4)) because they suggest interpretations adaptable to almost all other major and minor effects in seasonality of suicide. In view of these effects, suicide seasonality emerges as a matter of social psychology: as a reflection of a highly ambivalent and, lastly, opportunistic behavior.

Regarding question 1 above, climatic conditions comprise quite distinct characteristics, and their influence on physiological processes as well as on social rhythms differs. Temperature, sunlight, and so forth, influence different

endocrinologic processes and different social activities. Determining a general aggregate effect of climatic conditions on suicide behavior, as suggested by Volpe and Tavares (1), does not improve our understanding of the underlying mechanisms.

We need to be specific also from the point of view of different types of effects. These effects are either direct, for example, in many biologic processes, or indirect, which are typical for socially mediated behavior. Therefore, we need analysis strategies that facilitate differentiation.

In terms of question 2, we presented such a strategy in our paper (2). We built it on the special case of a pretended dose-response effect of temperature on suicide frequencies. Doing so enabled us to transform parts of the analysis to the next data level, that is, from seasons to months, and to avoid making bold inferences from seasonal cycles on other seasonal cycles.

Unquestionably, multiple regression, as applied by Volpe and Tavares (1), is not admissible in this context, either with or without preceding cosinor analysis—not only because of the traps in the analysis of cyclical data but also because of the well-known general features of time series, such as serial dependence.

Regarding question 3, from 1 and 2 above we have to conclude that there is little promise in answering questions such as, how much of seasonality could be explained by the climate? and that it is inadvisable to maintain a high level of abstractness. We need to be specific, to state specific hypotheses about associations and putative causal mechanisms, to falsify them, or, alternatively, to add more detailed information.

Finally, for question 4, the preconditions in the epidemiology of suicide are suitable for this purpose. They are different from psychiatric epidemiology in general. Whereas the latter indeed needs more longitudinal and large-scale studies, the epidemiology of suicide is based on over 100 years of intense empirical research accompanied by much theoretical ''background noise.'' It is a domain we know a considerable amount about but understand fairly little of in actual fact. The clue to improving our understanding is not a series of large-scale studies but rather well-directed exploration of irregular and anomalous empirical findings, which helps to overcome obsolete theoretical concepts. The progress we actually experience in research on suicide seasonality relies on enhanced detection and integration of such findings.

ACKNOWLEDGMENTS

Conflict of interest: none declared.

REFERENCES

1. Volpe FM, Tavares A. Re: ''Seasonal associations between weather conditions and suicide—evidence against a classic hypothesis.'' (Letter). Am J Epidemiol 2007;166:237.
2. Ajdacic-Gross V, Lauber C, Sansossio R, et al. Seasonal associations between weather conditions and suicide—evidence against a classic hypothesis. Am J Epidemiol 2007;165:561–9.
3. Ajdacic-Gross V, Lauber C, Bopp M, et al. Reduction in the suicide rate during Advent—a time series analysis. Psychiatry Res (in press).
4. Jessen G, Jensen BF. Postponed suicide death? Suicides around birthdays and major public holidays. Suicide Life Threat Behav 1999;29:272–83.

Vladeta Ajdacic-Gross[1,2] and Matthias Bopp[2]
(e-mail: vajdacic@spd.unizh.ch)
[1] *Research Unit for Clinical and Social Psychiatry, Psychiatric University Hospital, CH-8021 Zürich, Switzerland*
[2] *Institute of Social and Preventive Medicine, University of Zurich, CH-8001 Zürich, Switzerland*

DOI: 10.1093/aje/kwm144; Advance Access publication May 22, 2007